## FOOD IRRADIATION DIALOGUE

Dr. D. B. Louria, in his *Counterpoint on Food Irradiation*, supports the application of food irradiation "...to protect people from the contamination by microorganisms in some food items.... But if used, it should be only under well-defined and limited circumstances."[1]

This proposal allows for a constructive dialogue. Food regulatory agencies in the United States and elsewhere have clearly defined the rules that have to be applied if and when irradiation is chosen for the processing of food. Regarding the "limited circumstances," this too is an acceptable proposal. From a public health point of view, those circumstances should be defined by epidemiologic evidence. The public health community should direct the application of irradiation to those foods. Their role in the causation of foodborne illness is particularly important, as shown by foodborne disease surveillance data.

Dr. Louria opposes "irradiating our foods with large amounts of radiation until the question about chromosome damage and nutrient loss are answered...." Although it is not clear what is meant by "large amounts of radiation," it is assumed that Dr. Louria refers to the application of higher doses (e.g., >10 kGy).

It comes as a surprise that Dr. Louria still refers to chromosome damage, quoting in this context the often-refuted article by Bhaskaram and Sadasivan.[2] In view of the weight of evidence of all the studies performed to date, it seems unlikely that the findings reported by Bhaskaram and Sadasivan were the result of consuming irradiated wheat, and more probable that the difference observed occurred by chance.

Regarding nutrient loss, it should be recalled that whereas chemical changes in the food are indeed radiation dose-dependent, there is a significant reduction in the overall chemical change when the food is irradiated while frozen. Macronutrients (proteins, fats, and carbohydrates) are not significantly altered in terms of nutrient value and digestibility by the irradiation treatment. Among the micronutrients, however, some of the vitamins are susceptible. However, irradiation in the absence of oxygen and at cryogenic temperatures will enhance the retention of nutritional quality.

In conclusion, although Dr. Louria's caution regarding the wide application of food irradiation is respected, it is clear that the scientific community has done its homework regarding the safety assessment of irradiated food. Two major World Health Organization (WHO) reports plus J.F. Diehl's book provide ample evidence that irradiated food is both safe and nutritionally adequate.[3-5] It is time for the potential of irradiation to contribute to food safety (and to food security) to be put into routine public health and agricultural practice.

### References

1. Louria DB. Counterpoint on food irradiation [Editorial]. Int J Infect Dis 2000; 4:67-69.
2. Bhaskaram C, Sadasivan G. Effects of feeding irradiated wheat to malnourished children. Am J Clin Nutr 1975; 28:130-135.
3. Safety and nutritional adequacy of irradiated food. Geneva: WHO, 1994.
4. High-dose irradiation: wholesomeness of food irradiated with doses of 10 kGy. WHO Technical Report Series 890. Geneva: WHO, 1999.
5. Diehl JF. Safety of irradiated food. 2nd Ed. New York: M. Dekker, 1999.

Fritz K. Käferstein, DVM, PhD
Former Director of the Programme of Food Safety and Food Aid, World Health Organization
Geneva, Switzerland
Distinguished Visiting Scientist with the Joint Institute for Food Safety and Applied Nutrition
Washington, DC, USA

## FOOD IRRADIATION LABELING

My commentary was intended to initiate a dialogue on an important issue. Dr. Käferstein's response is appreciated. Although the study on chromosome damage in malnourished children fed irradiated wheat in India has been severely criticized, and also vigorously defended by the authors, it has not been refuted. The only way to do that would be by carrying out properly designed studies that do not confirm the findings. To my knowledge, there is only one such study, in China. An examination of published data from that allegedly negative study suggests that, in fact, those fed irradiated foods experienced chromosomal damage. I do not believe the issue is settled; it will not be, until a careful short-term (4-month) study is carried out on diverse subgroups.

Dr. Käferstein is correct that nutritional loss is reduced by carrying out irradiation in the cold in the absence of oxygen—reduced, but not eliminated; and the adverse nutritional effects are dose-related. Furthermore, reducing damage during the irradiation process does not alter the possibility of accelerated vitamin loss during normal processing (cooking, freezing and thawing, etc). Every food item that is proposed for irradiation should be tested for nutrient loss, using the irradiation process and dosage that will be applied to the food item that will be sold to the public. Nutrient status must be analyzed before and immediately after irradiation, and after the usual food processing (such as cooking). The results should then be recorded on the label.

Surely that is not too much to ask of an industry that stands to make huge profits from the technology, and clearly, it is in the public interest. Additionally, of course, every irradiated food item should be clearly marked with the statement "irradiated," not with euphemisms designed to hoodwink the public; and the public should always have options of buying non-irradiated foods.

Donald B. Louria, MD
Professor and Chairman Emeritus
New Jersey Medical School
Newark, New Jersey

*Editor's Note*—More on this will appear in our next issue.